

Amendments to the Claims

Claim 1 (Previously presented): Seed of maize inbred line designated PH581, representative seed of said line having been deposited under ATCC Accession No. PTA-4432.

Claims 2-57 (Canceled)

Claim 58 (Previously presented): A maize plant, or a part thereof, produced by growing the seed of claim 1.

Claim 59 (Previously presented): The maize plant of claim 58 wherein said plant has been detasseled.

Claim 60 (Previously presented): A tissue culture of regenerable cells produced from the plant of claim 58.

Claim 61 (Previously presented): Protoplasts produced from the tissue culture of claim 60.

Claim 62 (Previously presented): The tissue culture of claim 60, wherein cells of the tissue culture are from a tissue selected from the group consisting of leaf, pollen, embryo, root, root tip, anther, silk, flower, kernel, ear, cob, husk and stalk.

Claim 63 (Previously presented): A maize plant regenerated from the tissue culture of claim 60, said plant having all the morphological and physiological characteristics of inbred line PH581, representative seed of said line having been deposited under ATCC Accession No. PTA-4432.

Claim 64 (Previously presented): A method for producing an F1 hybrid maize seed, comprising crossing the plant of claim 58 with a different maize plant and harvesting the resultant F1 hybrid maize seed.

Claim 65 (Previously presented): A method of producing a male sterile maize plant comprising transforming the maize plant of claim 58 with a nucleic acid molecule that confers male sterility.

Claim 66 (Previously presented): A male sterile maize plant produced by the method of claim 65.

Claim 67 (Previously presented): A method of producing an herbicide resistant maize plant comprising transforming the maize plant of claim 58 with a transgene that confers herbicide resistance.

Claim 68 (Previously presented): An herbicide resistant maize plant produced by the method of claim 67.

Claim 69 (Previously presented): The maize plant of claim 68, wherein the transgene confers resistance to an herbicide selected from the group consisting of: imidazolinone, sulfonylurea, glyphosate, glufosinate, L-phosphinothricin, triazine and benzonitrile.

Claim 70 (Previously presented): A method of producing an insect resistant maize plant comprising transforming the maize plant of claim 58 with a transgene that confers insect resistance.

Claim 71 (Previously presented): An insect resistant maize plant produced by the method of claim 70.

Claim 72 (Currently amended): The maize plant of claim 71, wherein the transgene encodes ~~comprises a transgene encoding~~ a *Bacillus thuringiensis* endotoxin.

Claim 73 (Previously presented): A method of producing a disease resistant maize plant comprising transforming the maize plant of claim 58 with a transgene that confers disease resistance.

Claim 74 (Previously presented): A disease resistant maize plant produced by the method of claim 73.

Claim 75 (Previously presented): A method of producing a maize plant with decreased phytate content comprising transforming the maize plant of claim 58 with a transgene encoding phytase.

Claim 76 (Previously presented): A maize plant with decreased phytate content produced by the method of claim 75.

Claim 77 (Previously presented): A method of producing a maize plant with modified fatty acid metabolism or modified carbohydrate metabolism comprising transforming the maize plant of claim 58 with a transgene encoding a protein selected from the group consisting of stearyl-ACP desaturase, fructosyltransferase, levansucrase, alpha-amylase, invertase and starch branching enzyme.

Claim 78 (Previously presented): A maize plant produced by the method of claim 77.

Claim 79 (Previously presented): The maize plant of claim 78 wherein the transgene confers a trait selected from the group consisting of waxy starch and increased amylose starch.

Claim 80 (Currently amended): A maize plant, or part thereof, ~~capable of expressing~~ having all the physiological and morphological characteristics of the inbred line PH581, representative seed of said line having been deposited under ATCC Accession No. PTA-4432.

Claim 81 (Currently amended): A method of introducing a desired trait into maize inbred line PH581 comprising:

(a) crossing PH581 plants grown from PH581 seed, representative seed of which has been deposited under ATCC Accession No. PTA-4432, with plants of another maize line that comprise a desired trait to produce F1 progeny plants, wherein the desired trait is selected from

the group consisting of male sterility, herbicide resistance, insect resistance, disease resistance and waxy starch;

(b) selecting F1 progeny plants that have the desired trait to produce selected F1 progeny plants;

(c) crossing the selected progeny plants with the PH581 plants to produce backcross progeny plants;

(d) selecting for backcross progeny plants that have the desired trait and physiological and morphological characteristics of maize inbred line PH581 listed in Table 1 to produce selected backcross progeny plants; and

(e) repeating steps (c) and (d) three or more times in succession to produce selected fourth or higher backcross progeny plants that comprise the desired trait and all of the physiological and morphological characteristics of maize inbred line PH581 listed in Table 1 as determined at the 5% significance level when grown in the same environmental conditions.

Claim 82 (Currently amended): A plant produced by the method of claim 81, wherein the plant has the desired trait and all of the physiological and morphological characteristics of maize inbred line PH581 listed in Table 1 as determined at the 5% significance level when grown in the same environmental conditions.

Claim 83 (Previously presented): The plant of claim 82 wherein the desired trait is herbicide resistance and the resistance is conferred to an herbicide selected from the group consisting of: imidazolinone, sulfonylurea, glyphosate, glufosinate, L-phosphinotricin, triazine and benzonitrile.

Claim 84 (Previously presented): The plant of claim 82 wherein the desired trait is insect resistance and the insect resistance is conferred by a transgene encoding a *Bacillus thuringiensis* endotoxin.

Claim 85 (Previously presented): The plant of claim 82 wherein the desired trait is male sterility and the trait is conferred by a cytoplasmic nucleic acid molecule that confers male sterility.

Claims 86-87 (Canceled)

Claim 88 (Currently amended): A method of modifying introducing modified fatty acid metabolism, modified phytic acid metabolism or modified carbohydrate metabolism into in maize inbred line PH581 comprising:

- (a) crossing PH581 plants grown from PH581 seed, representative seed of which has been deposited under ATCC Accession No. PTA-4432, with plants of another maize line that comprise a nucleic acid molecule encoding an enzyme selected from the group consisting of phytase, stearyl-ACP desaturase, fructosyltransferase, levansucrase, alpha-amylase, invertase and starch branching enzyme;
- (b) selecting F1 progeny plants that have said nucleic acid molecule to produce selected F1 progeny plants;
- (c) crossing the selected progeny plants with the PH581 plants to produce backcross progeny plants;
- (d) selecting for backcross progeny plants that have said nucleic acid molecule and physiological and morphological characteristics of maize inbred line PH581 listed in Table 1 to produce selected backcross progeny plants; and
- (e) repeating steps (c) and (d) three or more times in succession to produce selected fourth or higher backcross progeny plants that comprise said nucleic acid molecule and have all of the physiological and morphological characteristics of maize inbred line PH581 listed in Table 1 as determined at at the 5% significance level when grown in the same environmental conditions.

Claim 89 (Currently amended): A plant produced by the method of claim 88, wherein the plant comprises the nucleic acid molecule and has all of the physiological and morphological characteristics of maize inbred line PH581 listed in Table 1 as determined at at the 5% significance level when grown in the same environmental conditions.